UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
726 MINNESOTA AVENUE
KANSAS CITY KANSAS 66101

FEB

Site Southern Cross Lumber
ID # MOD980685176
Break 9.1
Other
2/11/99
0969

Ms Elaine Seele
St Louis County Water Company
535 North New Ballas Road
St Louis, Missouri 63141

Dear Ms Seele

The United States Environmental Protection Agency (EPA) has completed a response action at the Southern Cross Lumber Company (Southern Cross) site located in Hazelwood Missouri, north of James S McDonnell Boulevard on Byassee Drive Soils and other materials exceeding 1 part per billion (ppb) 2,3,7,8-tetrachlorodibenzo-p-dioxin (dioxin) were excavated and transported to the Times Beach Missouri, site from November 8, 1996, through December 5, 1996 A total of 4,304 61 tons of contaminated material was removed and transported to Times Beach for incineration and final disposal during this action

The Agency for Toxic Substances and Disease Registry (ATSDR) [a component of the U S Public Health Service] and the Missouri Department of Health (MDOH) have provided recommendations to the EPA for removal of dioxin-contaminated materials in residential areas These health guidelines for residential areas require removal of dioxin-contaminated materials exceeding 1 ppb in the upper one foot measured from the surface At depths greater than one foot, residential clean-up criteria can be achieved by removing soil and other materials exceeding 10 ppb dioxin concentration and backfilling to the original surface with clean material This latter clean-up criteria is protective of human health due to the barrier formed by the clean soil layer and because of soil mixing that would occur in the event of excavation or other soil disturbing activities which would reduce potential exposure to acceptable levels

Sampling performed by the EPA at the Southern Cross site following excavation of dioxin-contaminated materials confirmed that residential clean-up criteria were achieved In accordance with recommendations from ATSDR, this level of clean up is protective for utility workers that could be involved in excavation and other earth-disturbing activities at the site A health consultation from ATSDR is enclosed which discusses the level of exposure that would be anticipated in such instances Consistent with this health consultation, the use of personal protective equipment is not required for protection of utility workers that may come into contact with soils and other materials remaining at the Southern Cross site

These recommendations are based upon sampling performed by the EPA following removal of dioxin-contaminated materials from the site The EPA believes this sampling to be representative of conditions remaining at the site and valid for basing health recommendations The EPA has no information that higher contaminant levels remain at the site than described in this letter, or any information that would indicate the presence of other hazardous substances at the site exceeding health-based levels

If you would like to discuss the status of the Southern Cross site further, I can be reached at (913) 551-7697

Sincerely,

Robert Feild
Project Manager
Eastern Missouri Dioxin Sites
Missouri/Kansas Remedial Branch
Superfund Division

Enclosure

cc Denise Jordan-Izaguirre, ATSDR
James H Long, MDNR

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Agency for Toxic Substances
and Disease Registry

Memorandum

Date July 29, 1992

From Chief, TSS, ERCB, DHAC (E32)

Subject Health Consultation Utility Workers and Dioxin Sites
Eastern Missouri

To Denise Jordan-Izaguirre
ATSDR Senior Regional Representative
EPA Region VII
Through Director, DHAC (E-32) for RCW
Chief, ERCB, DHAC (E-32)

BACKGROUND AND STATEMENT OF ISSUES

The Agency for Toxic Substances and Disease Registry (ATSDR) was requested by the Environmental Protection Agency (EPA) to comment on the potential for occurrence of adverse health effects among utility workers as a result of occupational activities at "dioxin" sites that were remediated to levels permitting residential use [1] Correspondence between the Centers for Disease Control (CDC), ATSDR, and EPA Region VII in 1987 and 1988 recommended and supported levels of 1 part per billion (ppb) of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD-hereafter called dioxin) in residential surface soils and residual concentrations of 5 to 10 ppb in residential subsurface soils (at one foot depths and greater) [2-5] These levels were not considered to pose a health threat to residents or to individuals that engaged in excavation activities [2-5]

DISCUSSION

Occupational activities that might result in exposures of utility workers to dioxin-contaminated subsurface soils include installation, maintenance, or other activities associated with underground utilities Workers could be exposed to dioxin-contaminated soils by one or more of several routes, including ingestion, inhalation, and dermal contact

Considering feasible exposure scenarios and potential contributions to internal dose, ingestion is likely to be the primary route of concern to the utility workers at remediated, residential sites that may still have levels of dioxin up to 10 ppb in the subsurface soil Such ingestion exposures would occur either directly through hand to mouth activities, or indirectly as a result of swallowing inhaled particulates that become trapped in the upper respiratory tract

Estimates on frequency and chronicity of exposures of the utility workers were not available However, it is unlikely that exposures to dioxin-contaminated soils will occur daily on a chronic basis However, for this consultation, chronic, exaggerated exposures are assumed in the calculations and discussion presented below

Quantities of soil ingested by adults during work or other activities have not been well documented Limited evidence suggests a tentative value of 50 milligrams (mg) of soil per day (d) [6] However, for purposes of estimating exposure, ATSDR typically takes a more conservative approach and assumes that a 70 kilogram body weight (kgbw) adult will routinely ingest about 100 mg or 0 1 gram (g) of soil/d [6] Whether this is appropriate for utility workers is not known

Assuming an ingestion rate of 0 1 g of dioxin-contaminated soil (10 ppb or 10,000 picograms (pg)/g) per day over a working lifetime, the estimated dioxin exposure would be about 14 pg/kgbw/d (10,000 pg/g*0 1g/day*1/70 kgbw) This calculation assumes that exposures are to 10 ppb and does not take into account the real possibility that dilution of dioxin concentrations in subsurface soils will occur during occupational activities

The estimated exposure rate exceeds ATSDR's Minimal Risk Level (MRL) of 1 pg/kgbw/d and is considerably above EPA's risk specific dose of 0 006 pg/kgbw/d [7,8] The EPA's risk specific dose, which is currently under review by EPA, is based on evidence of carcinogenicity in rats exposed to dioxin at doses equivalent to about 10,000 pg TCDD/kgbw/day and greater [7]

The ATSDR MRL is an estimate of daily human exposure via a specified route to a dose of chemical that is likely to be without an appreciable risk of adverse noncancer effects over a specified duration of time [7] The MRL for dioxin (1 pg/kgbw/d) covers oral exposures of both intermediate (less than one year) and chronic (more than one year) durations [7,8] It is based on evidence of adverse reproductive effects in rats and monkeys orally exposed to a dose of about 1,000 pg dioxin/kgbw/d, which was the lowest dose observed in the study that produced the effect This dose is referred to as the lowest observed adverse effect level (LOAEL)

The MRL reflects a 1,000-fold uncertainty factor (UF) to account for 1) unknowns related to extrapolation of animal data to humans, 2) possible differences in sensitivities of human reactions to the substance, and 3) the use of a LOAEL because of the lack of a defined, "true" No Observed Adverse Effect Level

(NOAEL) Each of the three factors was assigned an UF of 10 and the UFs were multiplied The LOAEL value was then divided by the product (1,000) to obtain the route (oral) and duration (chronic) specific MRL

The calculated exposure rate of about 14 pg dioxin/kgbw/d assumes daily and chronic exposures to relatively large quantities of soil As noted earlier, such exposures are unlikely Furthermore, the calculated exposure rate assumes that 100% of the ingested soil-bound dioxin is absorbed This also is highly unlikely since available data suggest that absorption of soil-bound dioxin from the gastrointestinal tract is less than 50% of that which occurs from an oil vehicle (commonly used in experiments to promote solubility of dioxin) [7] This is supported by experimental data in animals that show soil-bound dioxin to be less toxic than an equivalent amount of dioxin given in a corn oil vehicle [7] Thus, considering less than 100% absorption and less than daily, chronic exposures, the actual dioxin exposure rates of utility workers is likely to be considerably less than the 14 pg dioxin/kgbw/d calculated above

CONCLUSIONS

Based on available information and data, ATSDR concludes that

1 Adverse health effects among utility workers are not likely to occur as a result of occupational exposures to dioxin-contaminated subsurface soils containing total dioxin up to 10 ppb,

2 Past EPA Region VII removal actions at residential Missouri Dioxin Sites remain protective of public health to the residents and to utilities personnel

RECOMMENDATIONS

None

If any additional information becomes available or if any clarification is needed please do not hesitate to contact this office at (404) 639-0616

Allan S Susten, Ph D , DABT

REFERENCES

1 Memo from Robert Field (SPFD, EPA Region VII) to Denise Jordan-Izaguirre (ATSDR Region VII) requesting ATSDR health consultation, April 16, 1992

2 Letter from Morris Kay (Regional Administrator, Region VII) to Renate Kimbrough (CDC) regarding cleanup strategies for Missouri Dioxin Site, January 16, 1987

3 Letter from Barry Johnson (Associate Administrator, ATSDR) to David Wagner (Director, WMD, EPA Region VII) in response to request for elaboration of proposed cleanup levels for certain Missouri Dioxin Sites, July 30, 1987

4 Letter from David Wagoner (Director, WMD, EPA Region VII) to Barry Johnson (Associate Administrator, ATSDR) regarding modifications of cleanup strategies for selected Missouri Dioxin Sites, September 9, 1988

5 Letter from Barry Johnson (Associate Administrator) to David Wagoner (Director, WMD, EPA Region VII) in response to September 9 letter, September 30, 1988

6 ATSDR Public Health Assessment Guidance Manual, March 1992

7 ATSDR Toxicological Profile for 2,3,7,8-Tetrachloro-Dibenzo-p-Dioxin, ATSDR/TP-88/23, June 1989

8 Draft Health Assessment Comparison Value - Soil - (Expires 6/30/92)

cc RPB

ATSDR DHAC ERCB TSS ASUSTEN mrg 7/29/92/639-0616

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